

# **Bacteria TMDL Development for the Rappahannock River Basin**

Public Meeting #1

June 20, 2007

The University of Mary Washington

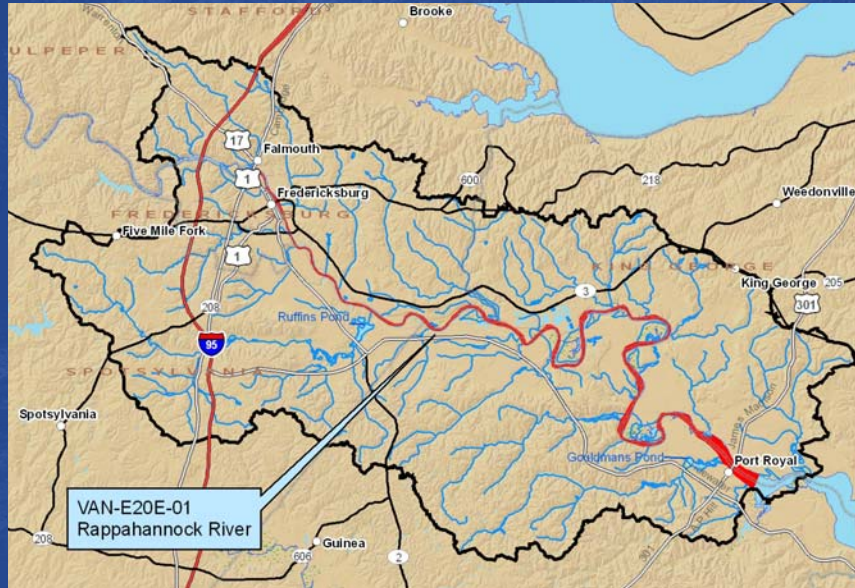


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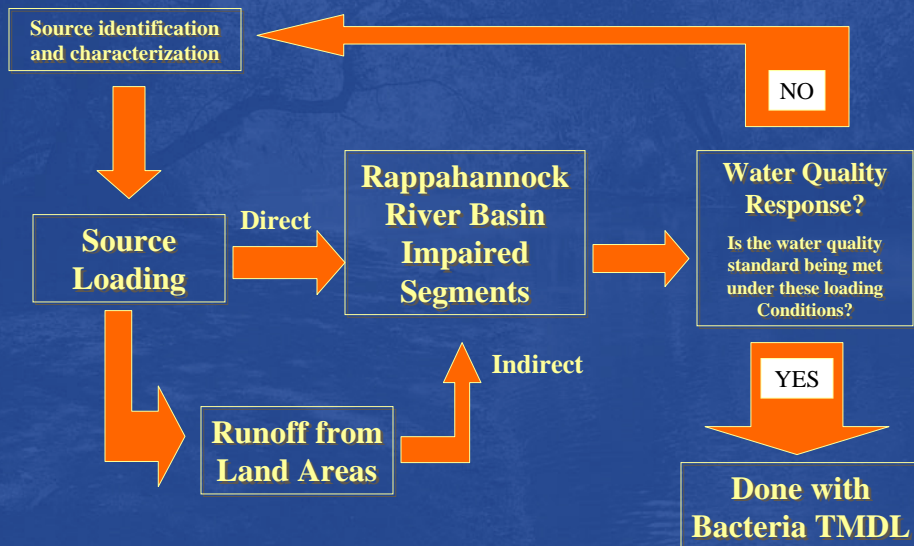
## **Objective:**

- To present and review the steps and the data used in the development of bacteria TMDLs for listed segments in the Rappahannock River Basin.

## Bacteria Impairment



## Linking the Source to the Instream Water Quality



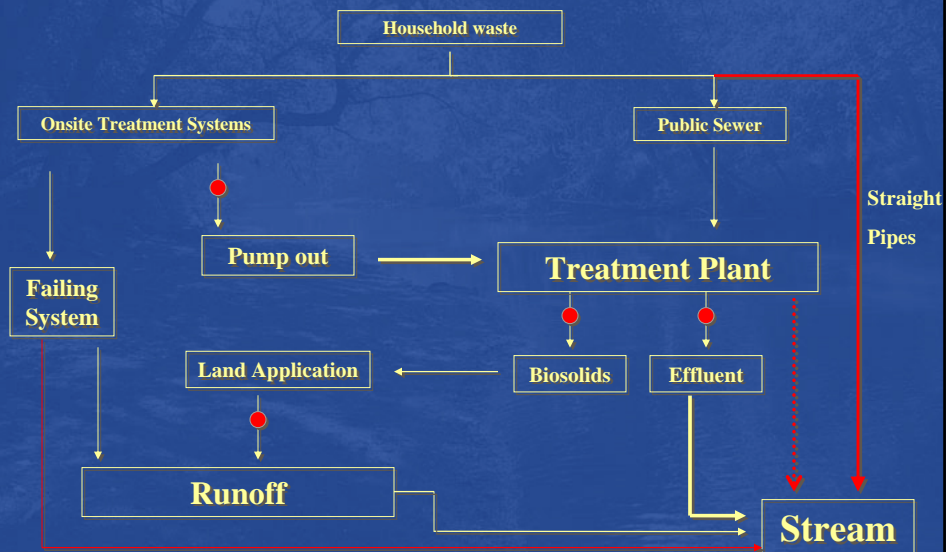
## Bacteria Sources Assessment

Addresses the following issues related to **bacteria** production:

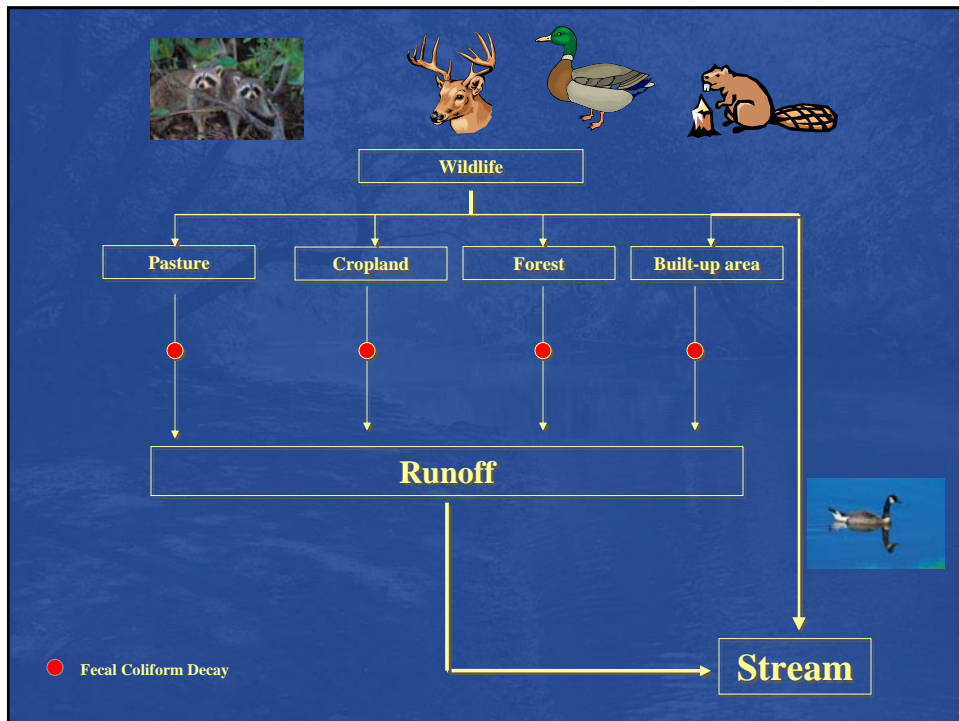
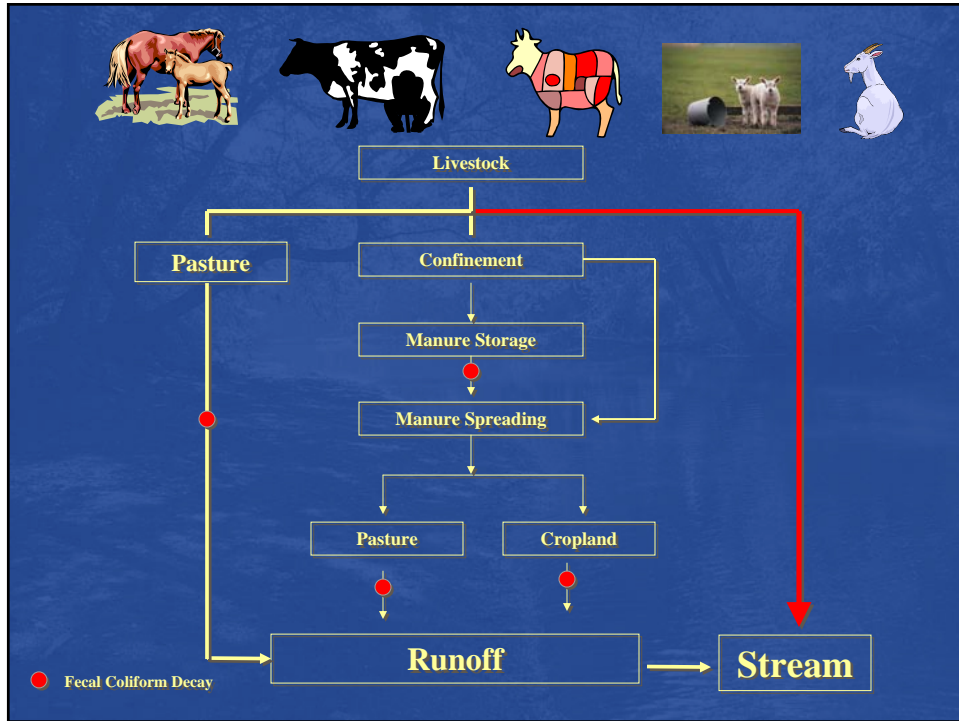
- **Bacteria loading from Human Sources**
  - Straight pipes
  - Septic systems
  - Biosolids
- **Bacteria loading from Livestock**
  - Livestock inventory
  - Livestock grazing and stream access
  - Confined animal facilities
  - Manure management
- **Bacteria loading from Wildlife**
  - Wildlife Inventories
- **Bacteria loading from Pets**
  - Pet Inventories
- **Best management practices (BMPs)**

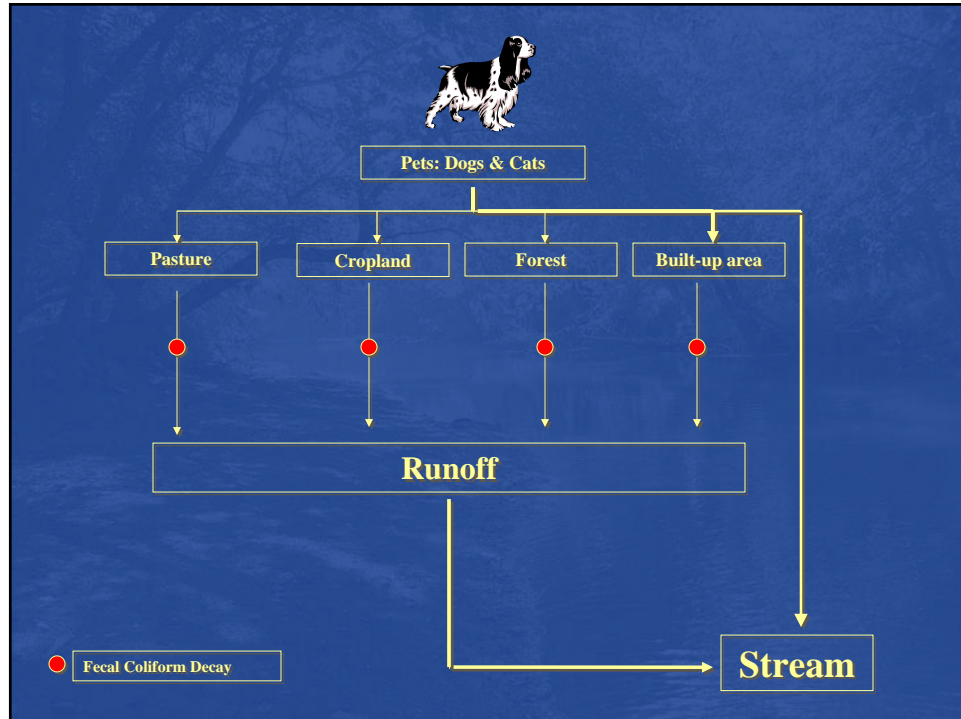
## Human Contribution

● Fecal Coliform Decay









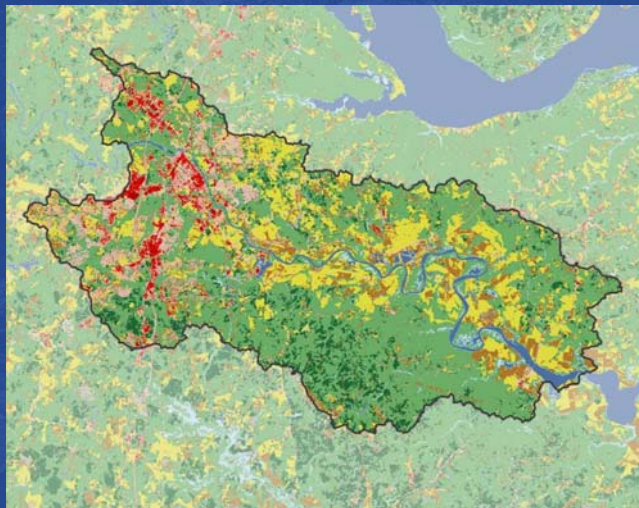
## Source Loading Estimates

- Determine the daily fecal coliform production by source
- Estimate the size/number of each source
- Determine whether the source is
  - Direct Source
  - Indirect Source
- Calculate the load to each land use based on a daily schedule and for each source
- The sum of all the individual sources is the total load
- Source loading estimates used in model to simulate in-stream bacteria concentrations

## Data and Information Needs:

- Watershed physiographic data
- Hydrographic data
- Weather data
- Permitted point sources and direct discharges
  - Permit data and information
  - Discharge monitoring reports (DMR)
- MS4 permits and information
- Environmental monitoring data
- Stream flow data
- Bacteria sources assessment data

## Rappahannock River Watershed Land Use



Dominant Land Use  
Types:

Forest: 53%

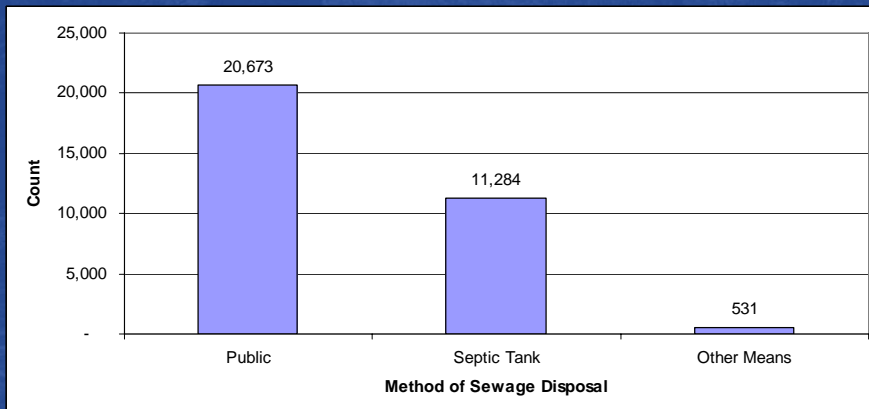
Agricultural: 29%



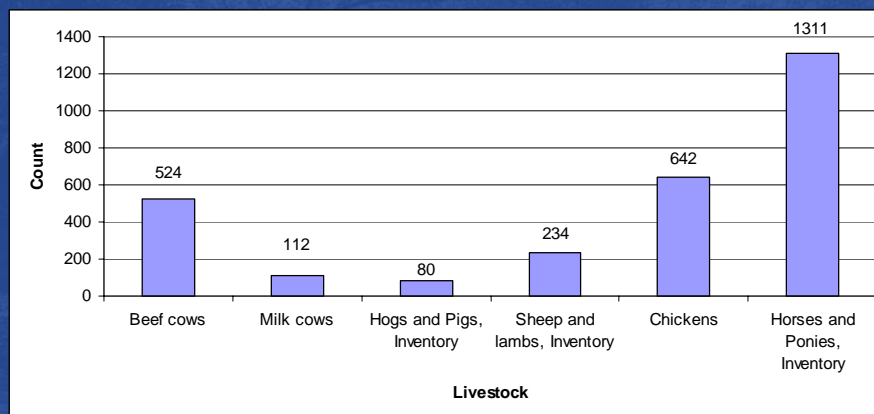
## Preliminary Population Estimates and Sewage Disposal

Based on 2004 United States Census Data:

- Population in the watershed is approximately 103,705 people

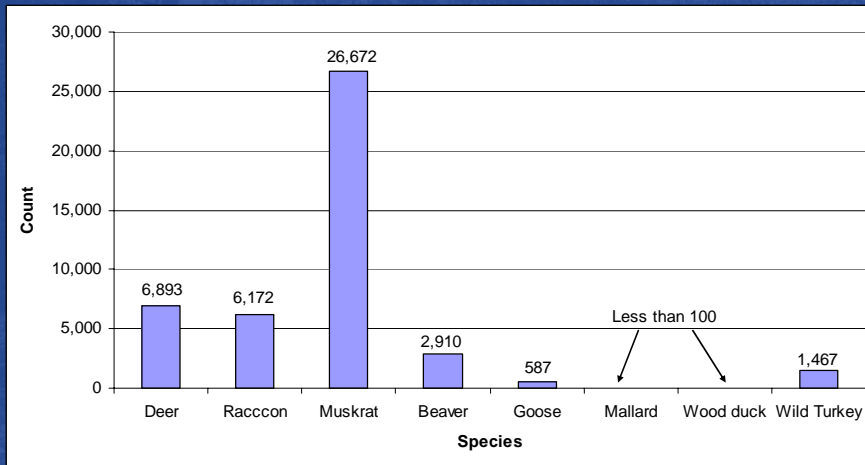


## Preliminary Livestock Estimates



Livestock numbers are based on the 2002 US Agricultural Census data and the horse numbers were based on the 2001 VA Agricultural Statistics Equine report.

## Preliminary Wildlife Estimates



Estimates are based on NLCD 2001 land use data and distribution estimates from DGIF

## Preliminary Pet Estimates

### Pet inventories based on:

- 0.543 Dogs per household\*
- 0.598 Cats per household\*

In the Rappahannock River Watershed there are approximately:

- 17,641 Dogs
- 19,266 Cats

\*Source: American Veterinary Medical Association (AVMA) estimates



## Rappahannock River Point Source Inventory

(VA Department of Environmental Quality)

Category	Permit Type	Count (Active or Application)
VPDES	Industrial	5
	Municipal	12
General Permits	Single Family Domestic Sewage	3
Total		20

### Next Steps

- Collect additional available data
- Finalize the inventories (Population, livestock, wildlife, etc)
- Analyze data to investigate the bacteria impairments in the watershed
- Develop:
  - Develop bacteria source loading estimates
  - Select model/technical approach
  - Develop Draft TMDL scenarios

## Local TMDL Contacts



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**Reports/presentations available at:**

[www.deq.virginia.gov/tmdl/mtgppt.html](http://www.deq.virginia.gov/tmdl/mtgppt.html)

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